

dependent, either directly or indirectly, on independent claim 1.

In the recent Written Opinion, the Examiner opined that claims 1-6 lacked an "inventive step" over Smigerski *et al.* (U.S. 4,788,231). Here, the Examiner said:

"Smigerski *et al.* disclose a tire tread comprising 100 parts diene based elastomer and filler comprising 40-250 phr carbon black and 0.1-6.5 phr zinc sulfate (col. 2, lines 38-51, col. 3, lines 26-56 and 61-62, and col. 5, line 32).

Although the present claims require that the tire tread comprise at least 7 phr zinc sulfate and Smigerski *et al.* disclose 6.5 phr zinc sulfate, given that the instantly claimed amount of zinc sulfate and that disclosed by Smigerski *et al.* are so close to each other it would have been obvious to one of ordinary skill in the art, absent evidence of criticality, that (i) the zinc sulfate disclosed by Smigerski *et al.* would have the same properties and similar functions as the zinc sulfate presently claimed and (ii) that the amount of zinc sulfate disclosed in the present claims is but an obvious variant of the amount disclosed by Smigerski *et al.*, and thereby one of ordinary skill in the art would have arrived at the claimed invention." (Emphasis added.)

In response to the foregoing, claim 1 has been amended to delete the word "about" as modifying the amount of zinc sulfate. Claim 1 as now amended, specifically requires that there be at least 7 phr of zinc sulfate to modify the viscoelastic properties of the elastomer. As the Examiner has conceded that Smigerski discloses a tire tread composition having 0.1-6.5 phr of zinc sulfate. However, there is no teaching in this reference of increasing the amount of zinc sulfate from 6.5 phr to at least 7 phr, an increase of almost 8%.

As the Examiner is well aware, the references themselves must teach or suggest the combination claimed. "Obvious to try" is not the appropriate standard. *See, e.g., In re Fine, supra* at 1075, 5 USPQ2d at 1599 ["whether a particular combination might be 'obvious to try' is not a legitimate test of patentability"]; *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F.2d 720, 725, 16 USPQ2d 1923, 1928 (Fed. Cir. 1990) ["we have consistently held that 'obvious to try' is not to be equated with obviousness under 35 UC 103"].

In the case-at-bar, the only teaching of providing zinc sulfate in an amount of at least 7 phr comes not from the prior art references, but from applicant's own disclosure. Here, we are immediately reminded of the frequent admonition that the Examiner is to avoid using hindsight to reconstruct the prior art with the specific knowledge of where he is heading. Borrowing from mythology, if Jason had known of the location of the Golden Fleece, he could have shortened his journey in search thereof significantly. Returning now to more recent times, the Federal Circuit has admonished that we are to avoid hindsight reconstruction of the prior art. In *W. L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. Denied*, 469 U.S. 851 (1984), Judge Markey said:

"To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim of the insidious effect of a hindsight syndrom wherein that which only the inventor taught is used against its teacher." (702 F.2d at 1012, 217 USPQ at 199.)

* * *

"It is difficult but necessary that the decision maker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made (often has here many years), to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." (721 F.2d at 1553, 220 USPQ at 313.)

Here, the Examiner has not suggested that any of the prior art references themselves (*i.e.*, within their "four corners") teach or suggest that the amount of zinc sulfate should be increased above Smigerski's specific range of 0.1-6.5 phr, to "at least 7 phr" as set forth in claim 1. Moreover, the Examiner has not demonstrated that a person skilled in the art would have perceived or appreciated any inadequacy or deficiency in Smigerski that would motivate such person to modify Smigerski's specific range of zinc sulfate. Absent such a motivation, the mental modification contemplated

by the Examiner is improper. *In re Wright*, 848 F.2d 1216, 6 USPQ2d 1959 (Fed. Cir. 1988).

Accordingly, twice amended claim 1 is believed to distinguish patentably from the prior art.

The Examiner also rejected dependent claim 4 for alleged "obviousness" over Smigerski in view of Shimizu (U.S. Pat. No. 5,508,333). Here, the Examiner said:

"The difference between Smigerski et al. and the present claimed invention is the requirement in the claim of silica.

Shimizu which is drawn to tire tread composition, disclose the use of silica filler in order to improve fracture properties, wet grip, and rolling resistance of the tire tread (col. 6, lines 56-59).

In light of the motivation for using silica disclosed by Shimizu as described above, it would therefore have been obvious to one of ordinary skill in the art to use silica in the tire tread of Smigerski et al. in order to improve fracture properties, wet grip, and rolling resistance of the tire tread, and thereby arrive at the claimed invention."

With all due respect, claim 4 is dependent on twice-amended independent claim 1. Hence, if claim 1 distinguishes patentably from the prior art, then claim 4 must similarly so distinguish.

The Examiner next rejected claims 1-6 for alleged "obviousness" over Shimizu in view of Smigerski and Umeda (U.S. Pat. No. 5,391,600). Here, the Examiner said:

"Shimizu discloses a tire tread comprising 100 parts diene based elastomer and 10-100 parts filler wherein the filler comprises 0.1-90 phr carbon black and 9.9-99.9 phr white filler such as barium sulfate or mixtures of barium sulfate and silica.

The difference between Shimizu and the present claimed invention is the requirement in the claims of (a) zinc sulfate and (b) particle size of zinc sulfate.

With respect to difference (a), Smigerski et al., which is drawn to tire treads, disclose the equivalence and interchangeability of zinc sulfate with barium sulfate wherein these metal salts are used to prevent particle segregation during processing (col. 1, lines 47-62, col. 2, lines 20-23, and col. 3, line 37).

In light of the disclosure of Smigerski et al., it would therefore have been obvious to one of ordinary skill in the art to use zinc sulfate as the filler in the tire tread of Shimizu in order to ensure effective processing, and thereby arrive at the claimed invention.

With respect to difference (b), Umeda et al., which is drawn to

resin composition, disclose the use of zinc sulfate having particle size less than 1 micron. The motivation for using zinc sulfate with such particle size is that it has superior smoothness of surface (col. 5, lines 25-31).

In light of the motivation for using zinc sulfate with particular particle size disclosed by Umeda et al. as described above, it would therefore have been obvious to one of ordinary skill in the art to use such zinc sulfate in the tire tread of Shimizu, and thereby arrive at the claimed invention."

With all due respect to the Examiner, Shimizu discloses a type of polymer material for use as a tire tread, that includes a filler such as white carbon. Applicant's attorney is unaware of any such substance. However, in col. 16, line 47 *et seq.*, Shimizu does speak of the use of barium sulfate as a filler material. However, the total amount of filler, including barium sulfate and whatever else may be present, is in the range of 10-100 phr. The Examiner has indicated that Shimizu teaches 9.9-99.9 phr of "white filler". However, this appears to be clearly erroneous. In column 17, line 20, Shimizu speaks of adding 9.9-99.9 parts by weight of white carbon, not "white filler". Hence, it is believed that the Examiner has misconstrued this reference. Moreover, her attempted reliance on a secondary reference to purportedly provide a stimulus for increasing the amount of zinc sulfate, is illustrative of the fact that the Shimizu reference does not contain any such teaching, as discussed *infra*.

The Examiner has also opined that one would be motivated to use zinc sulfate in lieu of barium sulfate because of its superior smoothness of surface. What does that come from? There is no teaching in the present application of the use of such material for its smoothness of surface? What is wrong with Smigerski's composition that would motivate a person skilled in the art to look to some other reference, such as Shimizu, to try to modify Smigerski's basic teaching? Moreover, it is pointed out that the third reference, Umeda, is not drawn to a tire tread composition, but to a

"polycarbonate resin composition". Why would someone who is desirous of improving a tire tread composition, have any motivation to look to the "polycarbonate resin composition" art to look for solutions to perceived common problems. The answer is that there is no such motivation. Hence, the Examiner's reliance on Umeda is believed to be misplaced.

Accordingly, claims 1-6 are believed to be in condition for allowance.

Claims 7 and 9-10

The Examiner rejected these claims for alleged "obviousness" over Shimizu in view of Craven (U.S. Pat. No. 3,878,147). Here, the Examiner said:

"Shimizu discloses a tire tread comprising 100 parts diene based elastomer and 10-100 parts filler wherein the filler comprises 0.1-90 phr carbon black and 9.9-99.9 phr white filler such as barium sulfate or mixtures of barium sulfate and silica. There is also disclosed a silane coupling agent to reinforce the white pigment (col. 16, line 41-col. 17, line 23 and col. 17, line 28).

The difference between Shimizu and the present claimed invention is the requirement in the claims of the particle size of barium sulfate.

Craven, which is drawn to tire tread treads, disclose the use of particles such as barium sulfate having particle size of 0.2-105 microns in order to provide the necessary level of friction to the tire (col. 2, lines 8, 13, and 16-18).

In light of the motivation for using barium sulfate with particular particle size disclosed by Craven as described above, it would therefore have been obvious to one of ordinary skill in the art to use such barium sulfate in the tire tread of Shimizu in order to control the level of friction, and thereby arrive at the claimed invention."

With all due respect to the Examiner, the Shimizu reference calls for 9.9-99.9 phr of white carbon, not "white filler". As mentioned above, Shimizu discloses a tire tread composition in which the total amount of filler is from 10-100 phr. However, the composition may have many different filler materials. Hence, the mere fact that the aggregate amount of filler must be in the 10-100 phr range, does not specifically teach the amount of barium sulfate in the range specified by applicant's

claim 7. Craven appears to disclose a type of spray-on composition that may be used to temporarily increase the traction of certain tires. However, this reference does not suggest improving the viscoelastic properties of the tire tread material itself. Rather, Craven at best contemplates a spray-on coating.

Accordingly, claims 7, 9 and 10 are believed to patentably distinguish from the teaching of the prior art.

Claims 14 and 16-17

Claim 14 has been amended to incorporate the additional limitations of original application claim 15, which has been cancelled.

The Examiner rejected these claims for alleged "obviousness" over Young (U.S. Pat. No. 5,063,268) in view of Kuan (U.S. 4,237,173). Here, the Examiner said:

"Young discloses a tire tread comprising 25-50% diene based elastomer, 20-50% carbon black, and 3-155 titanium dioxide and silica (col. 6, line 59, col. 7, line 35, and col. 7, line 67-col. 8, line 1). It is calculated from present claim 14 that the presently claimed tire tread comprises 39-77% diene based elastomer (100/260-100/130) and 23-61% filler. Thus, the amounts disclosed by Young clearly overlap those presently claimed.

The difference between Young and the present invention is the requirement in the claims of the particle size of titanium dioxide.

Kuan, which is drawn to tire composition, disclose that controlling the particle size of titanium dioxide to 0.1-0.5 microns ensures high brightness, high tinting strength, and ease of dispersion (col. 1, lines 44-47 and col. 2, lines 1-5).

In light of the motivation for using titanium dioxide with particular particle size disclosed by Kuan as described above, it would therefore have been obvious to one of ordinary skill in the art to use such titanium dioxide in the tire tread of Young in order to ensure high brightness, high tinting strength, and ease of dispersion of the pigment, and thereby arrive at the claimed invention."

With all due respect to the Examiner, Kuan is directed toward a cosmetic white sidewall

composition for a tire, not to the tire tread composition itself. White sidewalls (a/k/a "white walls") are simply decorative. More importantly, it is simply not understood why a tire designer, intent on improving the viscoelastic properties of a tire tread composition, would look to "brighten" the tire tread (*i.e.*, "where the rubber meets the road") by use of something that was used in a white sidewall. Moreover, virtually all tire tread compositions are black, not white. Here, there is simply no motivation for a person skilled in the art to attempt to draw from a reference from the tire sidewall art. With all due respect, the Examiner's reliance on this combination is believed to be illusory and unsupportable.

The Examiner further rejected these claims as being obvious over Senyek *et al.* (U.S. Pat. No. 5,310,815) in view of Kuan. Here, the Examiner said:

"Senyek *et al.* disclose a tire tread comprising 100 parts diene based elastomer and 25-125 phr filler comprising titanium dioxide, carbon black, and silica (col. 4, lines 37-40 and 62-65).

The difference between Senyek *et al.* and the present claims is the requirement in the claims of (a) specific amount of titanium dioxide and (b) particle size of titanium dioxide.

With respect to difference (a), although there is no explicit disclosure of the amount of titanium dioxide present, it would have been obvious to, as well as within the skill level of, one of ordinary skill in the art to choose amounts of titanium dioxide, including those presently claimed, in order to produce a tire tread with the desired amount of abrasion resistance and tensile strength, and thereby arrive at the claimed invention.

With respect to difference (b), Kuan, which is drawn to tire composition, disclose that controlling the particle size of titanium dioxide to 0.1-0.5 microns ensures high brightness, high tinting strength, and ease of dispersion (col. 1, lines 44-47 and col. 2, lines 1-5).

In light in of the motivation for using titanium dioxide with particular particle size disclosed by Kuan as described above, it would therefore have been obvious to one of ordinary skill in the art to use such titanium dioxide in the tire tread of Senyek *et al.* in order to ensure high brightness, high tinting strength, and ease of dispersion of the pigment, and thereby arrive at the claimed invention."

With all due respect to the Examiner, it is difficult to perceive while a tire designer would be tempted to move titanium dioxide, commonly found as the whiting agent in the sidewall of a "white wall" tire, into the blackened tread area. Certainly the tire designer would not wish to lighten the color of the tread. Hence, there is simply no motivation to make the mental modification contemplated by the Examiner. As noted above, it appears that the Examiner has attempted to selectively reconstruct the prior art after a studied knowledge of applicant's invention. While that is a very human trait, the Examiner is charged with the duty to forget what she has just learned of applicant's invention, and to be guided by the wisdom of the prior art references themselves. Here, there is simply no motivation in the prior art references of making the modification contemplated by the Examiner.

Accordingly, claims 14 and 16-17 are believed to patentably distinguish from the prior art.

This amendment is believed to be fully responsive to the Written Opinion of 5 April 2001, to squarely address each and every ground for objection or rejection raised by the Examiner, and to materially advance prosecution of this application toward immediate allowance. Replacement sheets for the further-amended claims are attached.

Formal allowance of claims 1-7, 9-10 14, and 16-17 is, therefore, courteously solicited.

Respectfully submitted,

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Amended Claims

1. A tire tread, comprising:
100 parts by weight of at least one diene-based elastomer; and
from about 30 to about 160 phr of filler, said filler comprising at least 7 phr of zinc sulfate to modify the viscoelastic properties of said elastomer.
2. A tire tread as set forth in claim 1 wherein the mean the particle size of said zinc sulfate is between about 0.5 and about 1.0 microns.
3. A tire tread as set forth in claim 1 wherein the said filler includes carbon black.
4. A tire tread as set forth in claim 1 wherein the said filler includes silica.
5. A tire tread as set forth in claim 1 wherein the aggregate amount of zinc sulfate in said filler is less than about 30 percent of the volume of said filler.
6. A tire tread as set forth in claim 1 wherein the aggregate amount of zinc sulfate is between 10 and about 30 percent by weight of said filler.
7. A tire tread, comprising:
100 parts by weight of at least one diene-based elastomer; and
from about 30 to about 160 phr of filler, said filler comprising at least about 7 phr of barium sulfate, wherein the aggregate amount of barium sulfate in said filler is less than about 30 percent of the volume of said filler and the aggregate amount of barium sulfate is between about 10 and about 30 percent by weight of said filler, and wherein the mean particle size of said barium sulfate is between about 1.0 and about 2.0 microns to modify the viscoelastic properties of said elastomer.
8. (Cancelled)

9. A tire tread as set forth in claim 7 wherein the said filler includes carbon black.
10. A tire tread as set forth in claim 7 wherein the said filler includes silica.
11. (Cancelled)
12. (Cancelled)
13. (Cancelled)
14. A tire tread, comprising:
100 parts by weight of at least one diene-based elastomer; and
from about 30 to about 160 phr of filler, said filler comprising at least about 8 phr of titanium dioxide, the mean particle size of said titanium dioxide being between about 0.5 and about 1.0 microns, and wherein the aggregate amount of titanium dioxide in said filler is less than about 30 percent of the volume of said filler and the aggregate amount of titanium dioxide is between 10 and about 30 percent by weight of said filler to modify the viscoelastic properties of said elastomer.
15. (Cancelled)
16. A tire tread as set forth in claim 14 wherein the said filler includes carbon black.
17. A tire tread as set forth in claim 14 wherein the said filler includes silica.
18. (Cancelled)
19. (Cancelled)